

## FLAT-ROCK ENDEMIC'S IN GRAY'S MANUAL RANGE

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In early November of 1973 we fortuitously encountered a granitic flat-rock area in Brunswick County, Virginia, whose vegetation was instantly recognized as differing from the usual type so common in the state. One peculiarity of these flat-rocks is the absence of *Selaginella rupestris* (L.) Spreng, for elsewhere in Virginia this species is a virtually ubiquitous member of the vegetation bordering expanses of siliceous rocks.

*Crotonopsis elliptica* Willd., *Hypericum gentianoides* (L.) BSP., *Opuntia compressa* (Salisbury) Macbride, old inflorescences of a *Minuartia*, and old rootstocks of a *Talinum* abounded. There was also a reddish *Portulaca*, old fruit stalks of an odd crassulaceous plant and a *Cyperus* resembling *C. aristatus* Rottboell, but much more robust, dominated large areas. We had by chance come upon granitic exposures whose borders and weather pits were abundantly vegetated with at least three southeastern flat-rock endemics. And oddly enough, these outcrops are within the area of intensive explorations made by Professor M. L. Fernald (1945) about three decades ago.

The odd crassulaceous plant, of course, is *Diamorpha Smallii* Britton, long considered a monotype and known on sandstone and granitic flat-rocks from Tennessee and Alabama to Georgia and the Carolinas. Although some would place the plant in the genus *Sedum*, its carpels are unique. They neatly dehisce by a vertical separation of the dorsal portion as shown in the clear and beautifully executed drawings of the late Maud H. Purdy in a paper by Svenson (1941). Moreover, because *Diamorpha* has an  $n$  chromosome number of 9, Baldwin (1940) suspects the genus of being an amphidiploid derived from 4- and 5-chromosome representatives of the genus *Sedum*. Both Henry Svenson, who worked with *Diamorpha* in the field

and laboratory, and J. T. Baldwin, who studied the phylogenetics of the Crassulaceae by chromosome analysis, still feel that *Diamorpha* is a valid genus (personal communications).

Seeds of *Diamorpha* which were planted in the greenhouse early in November germinated within a few days. When placed outside in the sun, the seedlings started to turn red. And when the flat-rocks were revisited in late January, shallow weather pits were already striking in appearance with their thickly-sprinkled carnelian-colored seedlings of *Diamorpha*.

The *Portulaca*, which is abundant on border zones and islands, is *P. smallii* P. Wilson, long known as a granitic flat-rock endemic. Its previously known range was from Georgia to North Carolina, and it is a relative of *P. pilosa* L. of the coastal plain.

And the third endemic, *Cyperus granitophilus* McVaugh, appears to be an exceptionally robust, aggressive, and cespitose type of *C. aristatus*, yet, two experienced and conservative cyperologists, Hugh O'Neill (1942) and Henry Svenson (personal communication), attest to its specific status. Furthermore, Murdy (1968) shows that *C. granitophilus* has consistently higher chromosome numbers, ranging from ca. 80 to 96 ( $2n$ ), than its apparent progenitor, *C. aristatus*, which has ca. 48, 56, or 64.

I have seen *Cyperus aristatus*, a smaller plant with stipitate achenes, only from Loudoun, Fairfax, Albemarle, and Bedford counties in Virginia, and the coarser, more aggressive plant with non-stipitate achenes, *C. granitophilus*, only from these flat-rock areas of Brunswick County on the southeastern edge of the piedmont.

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